S
10

HARVARD UNIVERSITY

Library of the
Museum of
Comparative Zoology

# ANNUAL REPORT

OF

# THE DIRECTOR

OF THE

# MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

1930-1931.

---

CAMBRIDGE, U. S. A.:
PRINTED FOR THE MUSEUM
1931.

# PUBLICATIONS

OF THE

# MUSEUM OF COMPARATIVE ZOÖLOGY

## AT HARVARD COLLEGE

---

There have been published of the Bulletin Vols. I to LXV, LXVII-LXXI; of the Memoirs Vols. I to LI.

The Bulletin and Memoirs are devoted to the publication of original work by the Officers of the Museum, of investigations carried on by students and others in the different Laboratories of Natural History, and of work by specialists based upon the Museum Collections and Exploration.

These publications are issued in numbers at irregular intervals. Each number of the Bulletin and of the Memoirs may be sold separately. A price list of the publications of the Museum will be sent on application to the Director of the Museum of Comparative Zoölogy, Cambridge, Massachusetts.

# ANNUAL REPORT

OF

# THE DIRECTOR

OF THE

# MUSEUM OF COMPARATIVE ZOÖLOGY

AT HARVARD COLLEGE

TO THE

PRESIDENT AND FELLOWS OF HARVARD COLLEGE

FOR

## 1930-1931.

---

LIBRARY
MUS. COMP. ZOÖLO
CAMBRIDGE, MAS

CAMBRIDGE, U. S. A.:
PRINTED FOR THE MUSEUM
1931.

# TABLE OF CONTENTS

---

PAGE

Report of the Director . . . . . . THOMAS BARBOUR 5

Report on the Birds . . . . . . . . . OUTRAM BANGS 11

Report on Marine Invertebrates . HUBERT LYMAN CLARK 14

Report of the Department of Oceanography HENRY BRYANT BIGELOW 16

Report of the Entomological Department . NATHAN BANKS 19

Report on Mammals . . . . GLOVER MORRILL ALLEN 23

Report on the Mollusks . . . WILLIAM JAMES CLENCH 26

Report of the Research Curator of Zoölogy LUDLOW GRISCOM 28

Report on Reptiles and Amphibians . ARTHUR LOVERIDGE 30

Report of the Department of Palaeontology HENRY CROSBY STETSON 32

Report on Helminthology . . JACK HENRY SANDGROUND 35

Report on Fishes . . . NICHOLAS ANDREEVICH BORODIN 38

Report on Birds' Eggs and Nests WINTHROP SPRAGUE BROOKS 41

Report on Fossil Echinoderms . ROBERT TRACY JACKSON 42

Report on the Coelenterates . . ELISABETH DEICHMANN 43

Report on the Library . . . ELEANOR KENDRICK SWEET 44

Publications . . . . . . . . . . . . . . . . . 47

Invested Funds of the Museum . . . . . . . . . . . 55

# MUSEUM OF COMPARATIVE ZOÖLOGY

## Faculty

ABBOTT LAWRENCE LOWELL, *President*
GEORGE RUSSELL AGASSIZ
HENRY BRYANT BIGELOW
JOHN ELIOT THAYER
THOMAS BARBOUR, *Director*

## Officers

| | |
|---|---|
| THOMAS BARBOUR | *Director* |
| SAMUEL HENSHAW | *Director Emeritus* |
| OUTRAM BANGS | *Curator of Birds* |
| HUBERT LYMAN CLARK | *Curator of Marine Invertebrates* |
| HENRY BRYANT BIGELOW | *Curator of Oceanography* |
| PERCY EDWARD RAYMOND | *Curator of Invertebrate Palaeontology* |
| JOHN CHARLES PHILLIPS | *Research Curator of Birds* |
| NATHAN BANKS | *Curator of Insects* |
| GLOVER MORRILL ALLEN | *Curator of Mammals* |
| WILLIAM JAMES CLENCH | *Curator of Mollusks* |
| JAMES LEE PETERS | *Assistant Curator of Birds* |
| ARTHUR LOVERIDGE | *Assistant Curator of Herpetology* |
| LUDLOW GRISCOM | *Research Curator of Zoölogy* |
| HENRY CROSBY STETSON | *Assistant Curator of Palaeontology* |
| ARTHUR CLEVELAND BENT | *Associate in Ornithology* |
| FREDERIC HEDGE KENNARD | *Associate in Ornithology* |
| KIRTLEY FLETCHER MATHER | *Acting Curator of Geological Collections* |
| ROBERT TRACY JACKSON | *Curator of Fossil Echinoderms* |
| WINTHROP SPRAGUE BROOKS | *Custodian of Birds' Eggs and Nests* |
| ELISABETH DEICHMANN | *Alexander Agassiz Fellow in Oceanography and Assistant Curator of Marine Invertebrates* |
| JACK HENRY SANDGROUND | *Curator of Helminthology* |
| NICHOLAS ANDREEVICH BORODIN | *Curator of Fishes* |
| HAROLD JEFFERSON COOLIDGE, JR. | *Assistant Curator of Mammals* |
| JOSEPH CHARLES BEQUAERT | *Associate Curator of Insects* |
| CHARLES THOMAS BRUES | *Associate Curator of Insects* |
| WILLIAM MORTON WHEELER | *Associate Curator of Insects* |
| JAMES COWAN GREENWAY, JR. | *Associate in Ornithology* |
| COLUMBUS O'DONNELL ISELIN, II | *Assistant Curator of Oceanography* |
| GEORGE NELSON | *Preparator* |
| ELEANOR KENDRICK SWEET | *Librarian* |
| HELENE MARY ROBINSON | *Secretary to the Director* |
| FRANCES MARY WILDER | *Assistant Secretary to the Director* |
| ELIZABETH VINCENT GRUNDY | *Secretary to the Museum Staff* |
| VIOLET LORRAINE HAMILTON | *Assistant in the Library* |
| DOROTHY HOWES | *Assistant in the Library* |

---

REGINALD ALDWORTH DALY . . *Sturgis Hooper Professor of Geology*

# REPORT OF THE DIRECTOR

## 1930–1931

---

To the President and Fellows of Harvard College:

The past year has seen such constant improvement in the exhibition rooms as it has been possible to make without curtailing unduly the time which the staff normally devotes to research. Plate glass has been installed in most of the rooms where the cases contained old glass of very poor quality and many of the cases have been enlarged and rearranged. The Australian and South American Rooms are now mostly furnished with plate glass and many of the specimens have been cleaned and freshened. The Hummingbird case in the South American Hall, through the kindness of James C. Greenway, Jr. and Harold J. Coolidge, Jr., has been rebuilt, electrically lighted to bring out the iridescent colors of the birds, and forms a particularly attractive exhibit.

Through the generosity of Mr. George R. Agassiz, the Fish Room has been entirely reglazed with plate glass, and is now in process of being rearranged. It has been possible to replace some of the poorer specimens with new mounts and many of the others have been remounted and freshened. The completed room will be far more instructive, as well as better looking than ever before.

The labeling of the exhibitions has progressed more rapidly this year, since, in coöperation with the botanical section of the University Museum, we now print our own labels here in the building. The Botanical printing shop was previously used but a small part of the time, but now, with a full time printer employed, it does regular job work for both sections of the Museum. This arrangement should have been made long ago and in the future it will be desirable to have a printing office to serve the whole University Museum.

For a few years longer it will be necessary to continue work on the exhibition collections in order to exhibit only carefully selected synoptic collections which will adequately meet the requirements of the general courses in zoölogy. The labeling, which in this

Museum has always been hopelessly inadequate, is slowly being improved, but much remains to be done. Miss Margaret D. Porter is helping most effectively in preparing copy for the new labels. The painstaking skill of Mr. George Nelson, the Museum's chief preparator, is shown in the splendid mounted skeleton of Diceratherium, the Rhinoceros of the Agate Springs deposit of fossil bones, as well as in the preparation of other notable vertebrate fossils recently placed on exhibition.

This year has seen several expeditions successfully terminated. Mr. Banks, with three assistants, collected in the Black and Great Smoky Mountains of North Carolina, bringing back many welcome additions to the entomological collections. Mr. Griscom made a successful trip to Guatemala and has completed an excellent work on the birds of that country. Mr. Loveridge returned from Africa with, as usual, a most astonishing amount of new and rare material, not only for the Museum of Comparative Zoölogy but for the Peabody Museum, which supplied him with funds to purchase ethnological specimens. I had the great good fortune to be the guest of Mr. Allison V. Armour on the yacht "Utowana" during the winter and early spring. The "Utowana" cruised along the west coast of Central America and Mexico and both coasts of the Gulf of California, primarily exploring for the United States Department of Agriculture, at the same time affording many opportunities to visit, and collect zoölogical specimens, in places seldom accessible to naturalists and of great interest. Mr. Clench, having received a Milton Fund grant, went to Florida with Mr. Schevill and made a collection to complete our series of Liguus, making it the best representation of this beautiful group which is fast vanishing before encroaching civilization. This summer we were able to send into the field another party, under the leadership of Erich M. Schlaikjer, to collect vertebrate fossils. Dr. Charles C. Mook of the American Museum of Natural History was able to give us three months of his valuable time to assist in this work, and five students are aiding them in searching for and preparing the fossils they have found for transportation to the Museum. A tract of land has been purchased at Torrington, Wyoming, which now serves, and long will serve, as headquarters for these expeditions in a locality which has proved to be a veritable gold mine of important vertebrate fossils. Professor Theodore Lyman kindly aided in this purchase, and the title stands in the name of the President and Fellows of Harvard College to be held for the use of the Museum of Comparative Zoölogy and the Department of Palaeontology.

Another expedition left the Museum in July for Australia but as yet has not had time to report progress. This expedition, to be absent from the Museum a year, is under the leadership of Dr. William M. Wheeler. The trip has been made possible through the generosity of anonymous friends of the Museum. A more detailed report of this project will be made next year.

Harold J. Coolidge, Jr. is at present in Europe, having traveled from Japan across Siberia. Mr. Coolidge has visited many foreign museums and arranged with many of our friends abroad important exchanges of material and publications. He is also gathering material for a forthcoming work on the Chimpanzees as a companion to his work on the Gorillas.

The Museum of Comparative Zoölogy has had an unusual number of visitors during the last year; among these, many of whom spent some time in study, may be mentioned: Dr. Anatol Heintz of Oslo; Professor Filippo Silvestri of Portici, Italy; Dr. Clive Forster Cooper of Cambridge, England; Sir Hubert Wilkins; Sir Frederic S. Kenyon, and Sir Henry A. Miers of the British Museum; Messrs. J. H. Fleming and L. L. Snyder of Toronto, Canada; Dr. P. A. Taverner of the National Museum, Ottawa, Canada; Dr. David Fairchild of Coconut Grove, Florida; Dr. Herbert C. Clark, Director of the Gorgas Memorial Institute of Panama; Dr. E. le Danois of the Department of Fisheries, Paris; Professor Julian S. Huxley of Kings College, London; Dr. H. M. Smith, Director of Fisheries at Bangkok, Siam; Prof. J. M. Derscheid of Brussels; Mr. P. G. Van Tienhoven of Amsterdam; Dr. Ellis G. Troughton of the Australian Museum, Sydney; Miss Dorothea M. A. Bate of the British Museum; Dr. J. L. Ritchie of Trinidad; Dr. William E. Hoffmann of Lingnan University, Canton, China; Dr. Ivar Broman, University of Lund, Sweden; Dr. C. G. Aguayo of Havana.

The great use which has been made of the collection through loans to investigators in other institutions is very gratifying, and details concerning these loans, as well as the many exchanges made during the year, will be found in the reports of the several curators.

I have spent much time in preparing a "Guide Book to the Museum," but this cannot be finished until the changes in the exhibition rooms are completed.

The Bureau of Fisheries has had office space in the Museum as during several recent years, and our relations with the investigators stationed here have been cordial and mutually advantageous. The new Woods Hole Oceanographic Institution was initiated in this building and had office space here until the new building at Woods Hole was available for occupancy. The American Committee for International Wild Life Protection has also had office space and assistance from the Museum of Comparative Zoölogy during the past year and will, we hope, continue to have its headquarters with us in the future. Tentative plans have been made for bringing in here also the Massachusetts Fish and Game Association, and there is no doubt but that such an arrangement would be greatly to the advantage of the Museum. It would enable our Staff to keep in closer touch with legislation regarding the preservation of wild life and with the great accumulation of information concerning the life histories of wild animals which is in the hands of this Association.

As the new Biological Building approaches completion plans are being prepared to make use of the rooms from which the Zoölogical Department of the University soon will move. These will be available for the expansion of some of the long overcrowded departments of the Museum. This changing of quarters will require some new equipment and will be a slow and costly proceeding. Some progress has already been made, since the building, during the last three years, has been completely wired for electricity, the old gas pipes have been removed, new water pipes have been installed, and the heating apparatus, thanks to the new central heating plant, is most satisfactory. The interdepartmental telephones, which were installed a few years ago, have also proved most useful to the Staff.

On my return from Central America last spring it was a pleasure to see the thrifty young trees planted on the front lawn of the Oxford Street side of the building. Thanks are due Mr. Griscom for getting the trees and to Prof. R. T. Fisher of the Harvard Forest for his supervision of their planting and early care.

The Museum of Comparative Zoölogy has received as a bequest of Walter Deane two of Audubon's plates of birds, framed, which aid in decorating the room containing the exhibition collection of North American Birds. We have also received, by bequest, a collection of Diatoms made by the late Henry W. Henshaw. Other gifts to the zoölogical collections are acknowledged in the reports of the Curators.

We have begun coöperation with the Museu Paulista of São Paulo, Brazil, in a modest program of field work. It is to be hoped that this may be continued and increased in the future. Dr. Allen has visited the southern museum and lectured there as Dr. Afranio do Amaral has visited us, to our great advantage, on several occasions.

One cause of concern has been the undermanned condition of our Department of Preparation. Mr. Nelson accomplishes a vast deal of fine work but he needs permanent assistants. Mr. Andre V. Azemian, Mr. Erich M. Schlaikjer, Mr. David Cheek and others have helped excellently in their spare time, but caring for vertebrate fossils is slow work.

I owe a debt of gratitude to Mr. Griscom for his aid in financial and editorial matters. The Director is a spendthrift by nature, and by nature also far too erratic ever to make a good editor and proofreader.

I am happy to say there is promise of some improvement in our financial condition which will stabilize and improve salaries. This is great good fortune.

The large and increasing number of young naturalists who now work in the Museum, either as volunteer assistants or as students under the curators, is most satisfying. The realization grows that in no way can so wide a grasp be gained of many aspects of animal life, such as of variation, of adaptation to environment, of distribution in time and space, and, above all, in the appreciation of the processes of evolution, as by working in a Museum in daily intimacy with its great collections. The Museum is no mere storehouse of dead and dusty trash, but is a living and vital center offering the same fascinating opportunity for, and incentive to investigation which comes to the student of history as he steps into one of the world's great libraries of books and manuscripts.

The Museum's place in present-day biology grows more, not less, important as its collections grow and as it leads more men both to the cabinet and into the field and to consider the study of the life histories of animals as much a part of its natural activity as the study of those which are preserved. The stations at Soledad, in Cuba, and at Barro Colorado Island, in Panama, and the Serpentarium at Lancetilla, in Honduras, offer to the Museum worker chances to do far more than simply to collect.

# REPORT ON THE BIRDS

By Outram Bangs

The total number of accessions for the year amounts to 6,491 skins. The number of generic desiderata has been considerably reduced. In some cases the gap has been filled by actually securing a specimen of the genus, but a number of names have been struck off by the discovery that many so-called genera had no real existence, but were based on hybrids. Of the 18,939 species listed in Sharpe's "Handlist" we now have 11,700, a gain of 451 over last year.

Three collections have been brought back by members of the Museum staff as follows: 39 specimens from the highlands of Guatemala by Mr. Griscom, 783 collected by Mr. Loveridge in Tanganyika Territory, and 217 skins collected by Dr. Sandground in southern Rhodesia and Portuguese East Africa. The report on the latter collection has already been published; the account of the birds brought back by Mr. Loveridge has been prepared and will appear in a volume detailing the results of the expedition. A collection of 212 birds from Matto Grosso, Brazil, was secured as a result of an expedition under the leadership of Jose Lima and his son, conducted for the joint benefit of the Museum of Comparative Zoölogy and the Museu Paulista. A second such expedition is now in the field.

Mr. James C. Greenway, Jr. has devoted many months of patient investigation to determine the value of the birds saved from the old Boston Museum after the great Boston fire of 1872. This great collection has been for years waiting for someone to settle once and for all which birds should be discarded and which preserved. A thankless task but one requiring great discrimination, as many rare exotic species have been disclosed and many possible types laid aside for further investigation. Mr. Greenway's volunteering to do this work has been very greatly appreciated by us all.

The largest single acquisition is the collection of the late Chauncey Ward Chamberlain of Boston, consisting of 3,012 skins, including a number of rarities, as well as several species new to the Museum. This collection was generously presented to the Museum by Mrs. Chamberlain. From the family of the late C. W. Jenks of Bedford, Mass., the Museum has received 109 skins of Massachusetts birds; Dr. G. Mello of São Paulo, Brazil, has presented 43 birds, all highly desirable, from the Brazilian state of São Paulo. The heirs of the late Charles C. Paine of Weston have donated five birds from his collection, including one each of the extinct Esquimo Curlew and Passenger Pigeon. A notable single accession is a specimen of the Philippine Monkey-eating Eagle (*Pithecophaga jefferyi*) presented by Governor General Dwight W. Davis. Mr. F. S. Mead sent us nine beautifully prepared skins of Red Grouse (*Lagopus scoticus scoticus*) from Scotland.

Small lots or single specimens were received from Dr. O. L. Austin, Jr., Mr. J. C. Greenway, Jr., Prof. A. O. Gross, Mr. Frank Herne, Mr. L. M. Huey, Dr. J. B. May, Dr. J. C. Phillips, Miss Caroline Sheldon, Mr. Frank Cundall of the Institute of Jamaica, the Peabody Museum of Salem, Mass., the Museu Paulista, and the Park Department of the city of Boston.

By purchase 1,321 skins were received. The largest accession under this heading is 541 birds collected by H. Wedel in eastern Panama; W. W. Brown sold us 316 birds from western Mexico, and more will be sent by him, since he is still in the field. Mr. Brown has lost nothing of his skill as a preparator. Fifty-four skins from J. D. La Touche practically completes the purchase of his splendid collection. One hundred and forty-four specimens from Spain and the Balearic Islands have been purchased from a German collector.

Six hundred and eighty-two birds have been received in exchange.

The Semitic Museum has transferred to us twelve mounted birds from Palestine.

Messrs. Bent and Kennard continue to work on and add to their respective collections.

It is a source of great satisfaction to the Department that the plans for expansion into Rooms 503 and 505, when they become vacant, have been approved by the Director.

The construction of two new cases in Room 504 has replaced a part of the overcrowded condition of the collection; the Picarian and Coraciiform birds as well as Hummingbirds, Swifts and Colies have been transferred to the new cases, allowing for the expansion of the Parrots and Trogons.

The total number of birds carded during the year is 5,176. Following the order of Sharpe's "Handlist," all the species contained in the first two volumes and up to page 88 of the third volume have been carded.

The first volume of Mr. Peter's "Checklist of Birds of the World" was sent to press about the first of February and should appear before the first of October. Work on the second volume is actively under way.

As in previous years, loans have been made to other institutions to aid ornithologists in their studies, and a certain amount of material has been borrowed for the use of the staff here.

Mr. Griscom has completed the report on the collections made by H. Wedel in eastern Panama. The report is awaiting publication as a Museum Bulletin.

Mrs. Bowen, as secretary to the Department, has performed her numerous and exacting duties in a most faithful and efficient manner.

# REPORT ON MARINE INVERTEBRATES

By Hubert Lyman Clark

The past year has been devoted in large part to the preparation of two reports of quite unlike nature. The first is an account of the echinoderms (except sea-stars) collected at Low Island, Queensland, in 1928–29, by the British Barrier Reef Expedition. There was much interesting material in this collection and many additions to the known fauna of Australia. A valuable series of specimens comes to the Museum in return for the preparation of this report, the publication of which is under the auspices of the British Museum. The other report is being prepared for the New York Academy of Sciences series on the natural history of Porto Rico. It has been thought best to make this a complete handbook of the littoral echinoderms of the West Indian region and as such it has developed into a more considerable task than was anticipated. A collection of echinoderms from Porto Rico, made by parties from the New York Academy, was sent me for examination, from which a series will be retained by the Museum. The preparation of the handbook was nearing completion at the end of the Museum year.

Curatorial work has occupied much time. The rearrangement and new cataloguing of the sea-stars, including the making of an accession catalogue, was completed early in the year. Large series of specimens from our huge collection of dry sea-urchins were selected, with the great assistance of Dr. R. T. Jackson, and sent to 19 museums in various parts of the world. At the same time a considerable mass of material of little or no value was weeded out and the whole collection was thus not only improved but made more accessible, and much valuable storage space was redeemed. Through the hearty coöperation of Mr. Fenner A. Chace, Jr. the collections of crustacea received a complete overhauling. The dry material is now labeled and arranged, so far as the Malacostraca are concerned, and the alcoholic Brachyura are also in satisfactorily accessible condition. Our sincere thanks are due Mr. Chace for his excellent work.

Accessions and publications have been at a minimum. A valuable collection of fresh-water crabs from East Africa, made by Mr. Loveridge, and identified by Dr. Mary J. Rathbun, is an important addition to our Brachyura. A considerable amount of Echinoderm material has come from Australia, loaned for study, from which we will receive series of specimens. From the United States National Museum a few specimens have been received in exchange; the most important are paratypes of each of the two species of the remarkable new genus of sea-urchin, Zenocentrotus, from Niuafou, Tonga Islands. Dr. R. T. Jackson presented a very notable series of specimens of *Echinus esculentus* from Plymouth, England, and the Isle of Man, collected and specially prepared by him in 1930. Mr. W. C. Schroeder has continued his generous interest in bringing in unusual echinoderms, crustaceans and worms from the western Atlantic. Our thanks are also due to Messrs. M. A. Carruthers, W. J. Clench, C. Goodrich, A. Loveridge, and J. H. Sandground for specimens received.

# REPORT OF THE DEPARTMENT OF OCEANOGRAPHY

By H. B. Bigelow

The only important accessions to the collection of Pelagic Coelenterates received during the year are the Siphonophores collected during the "Arcturus" Expedition, donated by Dr. William Beebe.

The Museum continues to coöperate with the United States Bureau of Fisheries under the same informal arrangement as in the past. During the year the following members of the Bureau, O. E. Sette, R. A. Nesbit, William Herrington, William C. Schroeder and E. W. Bailey, W. C. Neville and J. A. Webster, have carried on, in the Museum, studies on the life history of the mackerel, weakfish, cod, haddock, and other North Atlantic food fishes.

Mr. Schroeder's report on the codfish of the New England shores, based on his tagging experiments, has been published in Volume 46 of the Bulletin of the Bureau. Mr. Sette's investigations of the production and distribution of mackerel eggs and larvae and of the dominance of the particular year classes has been advanced to the stage where a general report can be prepared. The "Albatross II" has continued to make periodic cruises between the Gulf of Maine and Chesapeake Bay, bringing in large collections of plankton and a series of hydrological observations which will serve as the basis of a report on the physical oceanography of that region which has already been undertaken. Trawling has been done in the deep basin of the Gulf of Maine to throw light on the distribution there of little known fishes.

The association of the Museum with the International Ice Patrol and with the North American Council for Fisheries Investigation has been continued along the lines described in previous reports.

Miss Mary Sears worked on the bathypelagic crustacea collected by Mr. Iselin's schooner "Atlantis" in 1928; Miss Alice Beale on the medusae of the "Arcturus" Expedition.

During March, I attended the meeting of the International Council for the Exploration of the Sea, in Copenhagen, representing the North American Council and the Woods Hole Oceanographic Institution, as well as the Museum, and was also present at the meetings of the International Passamaquoddy Fisheries Investigation and the North American Council on Fisheries Investigation.

Most of my time, and Mr. Iselin's, during the year has been occupied with the organization of the Woods Hole Oceanographic Institution, the foundation of which was described in last year's report. The laboratory of the Institution at Woods Hole was completed during the winter, and opened for occupancy in June. During the summer, investigators have worked there on problems in marine sediments, oceanographic chemistry, marine bacteriology, physical oceanography, meteorology and experimental biology. Arrangements have also been made to provide accommodations during the winter for the physical oceanographer of the Ice Patrol Service and for the Executive Secretary of the International Passamaquoddy Fisheries Commission.

About the middle of April Mr. Iselin sailed for Copenhagen to superintend the final stages of construction of the research ship "Atlantis," which had been launched late in December. The trial trips were held early in June and the ship turned over to the Institution on June 18. She sailed from Copenhagen on July 2, reached Plymouth, England on July 7, sailed again from Plymouth on July 16, and arrived in Boston August 26. The scientific staff in addition to Mr. Iselin consisted of Dr. George L. Clarke, Instructor in Physiology at Harvard University, and Dr. Franz Zorell, who, through the friendly coöperation of the Deutsche Seewarte, in Hamburg, was able to join "Atlantis" for the cruise.

The scientific program, en route to Boston, consisted of physical and chemical observations at stations closely spaced along long. 30°, from lat. 53° southward to a point about 200 miles south of the Azores, thence more widely spaced westward, in charge of Dr. Zorell; experiments on light penetration with the light apparatus devised by Dr. Atkins of the Plymouth Laboratory; the vertical distribution of plankton, in charge of Dr. Clarke; and tows, especially for the collection of eel larvae, undertaken at the request of Dr. Johannes Schmidt.

While awaiting the arrival of "Atlantis," material for the investigators in the laboratory was obtained with the 40 ft. launch "Asterias," which the Institution has had built for work near shore.

# REPORT OF THE ENTOMOLOGICAL DEPARTMENT

By Nathan Banks

The year has been most notable in the progress made in getting the collection into systematic order. This has been made possible by having the new boxes purchased last year, and by the help of Mr. W. Creighton and Mr. P. Darlington. Mr. Fairchild continued to help with the Lepidoptera and Mr. Carpenter on the fossils. Thus hundreds of storage boxes have been emptied and many discarded.

Mr. Creighton finished arranging the ants, labeled many exotic Lepidoptera, transferred thousands of beetles, and mounted several lots of insects. He left in January. Mr. Darlington, working part time, continued the new arrangement of the Nearctic Coleoptera, and studied the Carabidae collected on our North Carolina trip last year, describing several new species.

Mr. Carpenter finished his revision of the Nearctic Panorpidae, continued the arrangement of the fossil insects and incorporated the numerous accessions.

Miss Bryant, besides attending to the spiders and some other alcoholic material, has identified several collections and described a number of new species of native spiders. Many of the European Lepidoptera were transferred to Scudder boxes, nearly all the Nearctic Hymenoptera are transferred to the new boxes, incorporating much material given by Dr. Wheeler. A large part of the Paine Collection has been labeled. Generic card indices have been prepared of the United States Diptera, European Orthoptera, and Hemiptera; over 1,500 cards written of catalogued types, and over 250 types verified and numbered. More than 12,000 specimens were mounted by the Curator, and more than half were labeled and put away. Comparison of specimens with types continues to take much time.

Several hundred old boxes have been cork-lined, and again the supply of empty boxes is getting short.

There were two students: Mr. G. Liu studying Coleoptera, and Mr. R. P. Dow studying Hymenoptera and Odonata of Cuba. Another student, Mr. E. Pearson, revised the Neotropical Pyrrhocoridae, describing some new species. The most important accession was the C. F. Clagg material from Mindanao, purchased by a friend. It consists of over 8,000 specimens of Neuroptera, Hemiptera, Diptera, and Hymenoptera, almost everything new to the collection.

The collection of Geometridae of the late Louis Swett was purchased by a friend; it contains about 50 types.

Dr. J. Bequaert presented a large lot of Hymenoptera from Arizona, miscellaneous insects from Colorado and Guatemala, and named flies and bees (with types) from Yucatan.

A friend gave miscellaneous insects collected by Mr. Stadelmann and Mr. M. Bates presented specimens which he collected in Honduras.

Professor R. C. Smith has given us the first set (including about a dozen types) of his Haitian Neuroptera.

A collection of about 2,300 fossil insects, taken in the Permian of Kansas by F. M. Carpenter and assistants, under a Sheldon Traveling Fellowship, has been turned over to the Museum.

A valuable collection of fossil insects was given by Professor E. W. Berry, and another, including some of Scudder's types, by Professor F. B. Gorham.

Professor R. Thaxter gave a large collection of West African Diopsidae which had been named by Mr. Curran and contained types of nine species.

In August and early September Mr. Carpenter, Mr. Darlington, the Curator and his son Gilbert, made an automobile trip (financed by a friend) to the Black and Great Smoky Mountains of North Carolina. Although the season was very dry, a large collection was obtained, much of it at over 5,000 feet. Fully 100 species were added to our collections. The Panorpidae helped Mr. Carpenter in his revision of that family, the Carabidae were particularly good, and Mr. Darlington has described the new species. The Parnidae also included several new species. Among the Arachnida are a dozen or more new to our collection; several hundred Oribatid mites were taken from moss. Many of the species taken high up are similar to, but not identical with those in the White Mountains. The Curator has worked up the Psychodidae obtained with one new species. Hardly any of these occur in the White Mountains. Mr. Carpenter is studying the numerous Trichoptera and finds various new genera as well as species.

To the Arachnida were added, during the year, a collection of spiders made by Mr. and Mrs. Creighton in the South (through Miss Bryant); duplicates from the Oklahoma spiders, and many named mites from Professor A. Jacot, western Phalangida from Dr. W. G. Dietz, and Cuban spiders from Mr. Dow. In this connection we record with deep regret the death of Mr. J. H. Emerton, long our adviser on many questions regarding spiders and a frequent donor of types and other material. We had depended upon him for most of the determinations in the micro-Theridiidae. The more useful parts of his collection and library have been added to our collection by his generous bequest.

For other additions to the collection we are indebted to the kindness of the following: Miss E. B. Bryant, Messrs. A. M. Boyce, A. Brower, W. J. Brown (including four types), G. Fairchild, R. Hopping (including three types), C. W. Johnson, A. P. Morse, J. G. Myers, R. H. Painter (including three types), H. M. Raup, E. B. Williamson (including four types) and W. M. Wheeler (including numerous types).

Mr. G. F. Hill returned another section of the Australian termites; Mr. E. D. Quirsfeld certain genera of Neotropical Elateridae, T. B. Mitchell the tropical Megachile (with thirteen types), and Mr. T. H. Hubbell the Centhophilus (with one type).

Two large collections of spiders were named: one from T. B. Kurata of the Royal Museum of Toronto was identified by Miss Bryant; the other, from Oklahoma, by the Curator—a report was prepared on this since there were a number of Sonoran species that were hardly expected in Oklahoma.

Some Hymenoptera from Nebraska collected by A. P. Morse were identified for Wellesley College.

Visitors included F. Silvestri, Myriopods; A. Brower, Catocala; Doris Blake, Chrysomelidae; A. N. Caudell, Neuroptera; J. H.

Roberts, Trichoptera; N. W. Blackman, Scolytidae; A. M. Boyce, Trypetidae.

Sets of duplicate paratypes of Orthoptera were sent to the American Museum and to the California Academy of Science.

Small exchanges were made with Stanley Bromley and C. S. Brimley.

# REPORT ON MAMMALS

By Glover M. Allen

The year has been notable for the number and variety of accessions by gift and exchange, amounting to about 1,300 specimens, chiefly skins and skulls. The most important exchange was that with the Field Museum of Natural History, for the better consummation of which the Curator spent several days in Chicago, and, with the hearty coöperation of the Department of Mammals through Dr. Wilfred H. Osgood and Mr. C. C. Sanborn, worked out an exchange for slightly over one hundred species, some 170 specimens, chiefly of smaller South American and Asiatic rodents, thereby adding several genera and a large number of species to our representation. From Hermano Nicéforo Maria of Bogotá, 35 specimens were received in exchange, including a genus, *Thrinacodus,* not previously represented; from the Cleveland Museum an exchange for eight specimens from northern Kenya Colony helped fill several gaps among East African species; while from the United States National Museum a much-desired topotype of the tree hyrax of Kilimanjaro was received in the same way. Two handsome skins of the local race of Fox Squirrel, *Sciurus niger bryanti,* were also secured from Mr. Ralph Jackson. Important purchases were: an incomplete skeleton of the Indian rhinoceros and one of the European harbor seal from Gerrard; as well as a collection of sixty species of small mammals chiefly from the Caucasus region, a result in part of the kind offices of Mr. Lawrence Coolidge. These include a number of rare or local forms, as the giant Spalax, the peculiar fossorial microtine, *Prometheomys,* and the genus *Arbusticola,* new for our collection.

The return of Mr. Arthur Loveridge with a splendid lot of nearly 900 mammals, large and small, the result of a year's work in Tanganyika Territory, was an event of the utmost importance in the history of the collection. About one hundred species are represented, a monument to his industry and skilful management. A brief report on these, embodying his field notes, has just been completed by us jointly, and includes the descriptions of several slightly differentiated geographic races. This and his previous collection, acquired a few years ago, give us a good representation of East African mammals.

Thanks are especially due to the Misses Carolyn and Eleanor Sheldon, who presented a collection of over ninety small mammals from Nova Scotia, collected and prepared by themselves. They have also most generously volunteered their help at various times in cataloguing and labeling. The department is further indebted to Miss Helen C. Hunt, Miss Margaret Porter, and Mr. Benjamin Shreve for assistance in various ways: Miss Hunt for help in cataloguing; Mr. Shreve for valuable service in shellacking the entire series of mammalian fossils; and Miss Porter for help with preparing labels for the exhibition collection, as well as in cataloguing. Specimens have been loaned to seven institutions and individuals.

In spite of restricted means, some progress has been made in cleaning accumulated skulls and in tanning large skins, so that at present the amount of unprepared specimens on hand is not very extensive. Two large wall cases with glassed-in doors have been added to the storage space for the better housing of big skulls such as those of elephants, rhinos, etc., which formerly suffered from the accumulation of dust on open shelves.

The preparation of a number of skeletons of fossil mammals for exhibition has gone actively on during the year, though rather outside the immediate care of the Curator. Among these Mr. Henry Seton has worked out a fine specimen of early Tertiary tapiroid, of which he has published a preliminary description and presented the type to the Museum.

Among the many donations to the collections may be mentioned: Asiatic pigs and monkeys from the American Museum of Natural History; several species from Guatemala from Dr. J. C. Bequaert, a Swiss chamois from Dr. H. B. Bigelow; two skins of the Philippine Tragulus from Honorable Dwight F. Davis; two Alaskan Muskrats from A. Hassalborg; a collection of house mice and field mice made in Greece and Asia Minor by Dr. Clyde E. Keeler; a collection of Chinese rats and mice from Mr. C. R. Kellogg of

Fukien University; a number of tanned hides and odd skulls of East African game from Mr. Edward Mallinkrodt, Jr.; several desirable Brazilian mammals from Museu Paulista; various Massachusetts specimens from Mr. J. L. Peters; two pumas, two peccaries and other specimens from Arizona, a large moose head from Alaska, and a buffalo skull from the Philippines from Dr. J. C. Phillips; a collection of over fifty small mammals and a fine leopard from Rhodesia from Dr. J. H. Sandground; skeletal and other material of anthropoids from the Cameroons through Reverend George Schwab; the collection of Nova Scotian mammals from the Misses Sheldon previously mentioned; several Central American bats from Mr. Stephen Thomas; a representative collection of North American *Myotis* from the United States National Museum; and the skins and skulls of three fallow deer from Dr. Hugo Weigold. The list of donors also includes: Dr. Oliver L. Austin, Jr., Dr. Thomas Barbour, the Boston Society of Natural History, C. B. Cosgrove, Dr. Herbert Clark, Harold J. Coolidge, Jr., William Everett Cram, Dr. Hanley, Arthur Loveridge, George H. Mackay, Professor Elisiario M. Mello, J. Miller, James H. Norton, Dr. George M. Saunders, Chausu M. Shih, Austin Smith, Donald Smith.

# REPORT ON THE MOLLUSKS

By William J. Clench

The growth of the collection during the past year has not been great, though several valuable accessions have been received. Total lots from all sources number 3,012; the largest single accession of 400 lots was obtained by an expedition in southern Florida.

Through exchange, the department has obtained some very desirable material from several important localities: Mr. A. W. B. Powell has sent a nearly complete series of his new species from New Zealand; Dr. H. A. Pilsbry has added an extensive set of Ashmonella and Sonorella, mainly paratypes, that he had obtained on his several collecting trips in New Mexico and Arizona, besides a duplicate set of the shells collected on the Pinchot Expedition to the West Indies and the South Seas. Mr. Calvin Goodrich, as in previous years, has been exceedingly generous in sending us complete series of shells collected by him both locally in Michigan and the southeastern states.

During the Museum year the following have been added: 3,012 accessions; 4 genera new to the collection; 259 species new to the collection; 28 holotypes; 55 paratypes; 29 cotypes.

A grant of $500 from the Milton Fund, and an addition to this fund made by the Museum, enabled the Curator and Mr. W. E. Schevill to explore a portion of the southern Florida Everglades. This trip was made to determine the distribution of several color races of the genus Liguus on Long Pine Key. Fifty-four hammocks were investigated within an area of sixty square miles of pineland and prairie. A total of 11,000 specimens were obtained which has added a host of data to this problem.

Mr. Archer, in part aided by a grant from the Museum, made a trip to Viñales, Cuba, to study the problem of isolation of species of Mollusks. Extensive series of specimens were obtained from several limestone "mogotes" in that region and a comparison of the material has been made. A report of the study is to be published shortly.

Mr. Rehder has continued his study of the Succiniidae and has made satisfactory progress with this problem. Mr. Fairchild, an undergraduate student, made a study involving the distribution and methods of dispersal of several forms of Liguus.

Grateful thanks are due Messrs. Archer, G. Banks, Fairchild and Rehder for assistance in much of the routine work of the department during the past year.

There has been a steady increase in the use of the collection during the past few years. Dr. Crozier has utilized the extensive series of Liguus for a comparative study of several mensurable characters. The department possesses extensive series in many genera in which similar studies could be made. The collections have been consulted as in the past by many students and specialists interested in a wide variety of problems.

The department owes much of its growth to the many friends who have contributed generously of their material. We are especially indebted to Messrs. A. F. Archer, G. Banks, J. C. Bequaert, E. Bowen, G. B. Fairchild, A. Loveridge, J. H. Sandground and W. S. Schroeder for large donations of specimens. In addition to the above the following have added to the collection by gift: T. Barbour, C. T. Brues, E. P. Cheatum, H. L. Clark, R. Deckert, P. de Mesa, R. Dow, S. C. Field, A. V. Kidder, N. W. Lermond, A. Navez, E. Perkins, H. Rehder, J. Schmidt, O. E. Sette, J. N. Shaw, S. Springer and F. S. Webber.

# REPORT OF THE RESEARCH CURATOR OF ZOÖLOGY

By Ludlow Griscom

This year closed with a slight surplus in the unrestricted funds, as a result of special efforts in economy. The surplus will be expended in replacing the old glass in the exhibition cases with plate glass in large sections. As anticipated in my last report, the receipts from sale of publications was much less than the preceding year, but this decrease in income was offset by the increase in the Museum's invested funds, and resultant slight increase in income.

Editorial work occupied a greater proportion of my time than in any previous year. Volume 71 of the Bulletin was begun and completed during the year. Something in the nature of a milestone was the closing of volume 55 with the issue of number 6, a volume which has been open since 1917. At least two months were devoted to the preparation of the manuscript, plates and maps of the important Woodworth and Wigglesworth memoir on the geology of Cape Cod. The publication of this report had been delayed for years due to its great bulk, the technical difficulties in the preparation of the maps, and the loss of copy for numerous proposed plates and text figures. The late Mr. George McLane Wood, the veteran editor of the United States Geological Survey, rendered invaluable assistance by reducing the bulk of the manuscript nearly one third. The colored maps were printed early in the winter with great assistance from the United States Geological Survey. By reproducing various plates from earlier papers and the preparation of some new drawings, made under the supervision of the Survey, it finally proved possible to devise a consecutively numbered series of plates in spite of the loss of copy for nearly half of the number originally proposed. With the number and subject matter of the plates finally determined and the manuscript reduced, it has been possible to undertake final editorial work, and the manuscript was sent to the printer in the spring. I have prepared a new and up-to-date price list of our publications, rendered possible by the stock taking of last year. Considerable revision proved desirable, and the papers actually out of print can now, for the first time, be definitely reported. The new list was sent to every institution on our exchange list, and has already produced a number of orders.

At the moment of writing the funds available for publication expenses are distinctly greater than four years ago. But the quantity of excellent manuscript offered for publication far exceeds the financial resources of the Museum, and this situation will tend to increase, as the reorganization of the Museum is completed, and the scientific staff has even more time for research.

The major research work of the year was the completion of the report on the Dwight Collection of Guatemala Birds. The introduction and the geographic analysis was begun in July, but it soon developed that in a country with such diversified climates and so complicated a topography, personal field experience was essential to a correct interpretation and comprehension of the data on the labels of the specimens. The month of August was accordingly spent in a reconnaissance trip, and thanks to the courtesy and hospitality of the United Fruit Company and its local officials, and the facilities they put at my disposal, the journey was easy, pleasant and productive. Nine days were spent at Lake Atitlan in securing further specimens of two recently discovered birds, known only from the vicinity of this lake, and two other little known species were rediscovered after a lapse of nearly seventy years. The introduction was completed on my return from Guatemala and the manuscript was sent to New York in June.

By January of 1931 Mr. H. Wedel completed his collecting of birds for the Museum on the Caribbean coast of extreme eastern Panama. The identification of this collection and the completion of a report upon it was my other research work of the year. This collection from a previously unknown section of Panama proves to have been amply worth while. It contained a surprising number of new forms, others new to Panama, many notable range extensions, and several rare and little known species new to the Museum's collection.

# REPORT ON REPTILES AND AMPHIBIANS

By A. Loveridge

The first half-year was entirely occupied with the identification, cataloguing and incorporation of material received during my absence of 1929–30. Approximately three months were spent in working over, cataloguing and preparing reports on the East African material to which reference was made last year. In all 4,650 entries were made in the catalogues and transferred to the card indices.

Mr. Benjamin Shreve very kindly volunteered his services and went over the collection of Amphibia Salientia, refilling with alcohol all losses by evaporation.

An unusually large number of donors, too numerous to mention, presented small series or single specimens. Among the more noteworthy accessions was a collection containing a number of types, made in North Africa by Dr. Franz Werner and presented by a friend of the department who donated many smaller lots. An exceptionally fine series of the Giant Frog (*Rana goliath*) formed part of a lot purchased from a collector in the Cameroons. From Rhodesia and Mozambique Dr. J. H. Sandground brought back a very useful collection which filled gaps in our scanty series from that region. Dr. C. E. Burt contributed a series of Texan amphibia. From the Lower Californian region Dr. Thomas Barbour himself collected some choice things such as *Crotalus enyo* and *Bipes biporus*. Mr. R. E. Stadelmann of the Serpentarium at Tela has continued to forward material which includes several rarities such as the third known example of *Oedipus schmidti*. From Jamaica came three fine iguanas (*Cyclura collei*), presented by Mr. William Guild.

Exchanges were arranged with fifteen institutions and resulted in 277 additions apart from 264 specimens from the United States National Museum.

Miss Olive G. Stull (Dr. Davis) spent the year in critically studying the Pythonidae while preparing a revision of that family on behalf of the National Research Council. Mr. Clinton V. MacCoy has continued his studies of the Scelopori during the same period. Other workers who have utilized the collections are Drs. H. L. Babcock, C. E. Burt, G. K. Noble and Messrs. Clifford Pope and Karl P. Schmidt.

Thirty-two loans of series or single specimens have been made to workers at various institutions, principally the National Museum, Michigan University Museum of Zoölogy, the Field Museum, British Museum and to Drs. A. do Amaral and E. R. Dunn.

A census of the collection follows:

| | *Genera* | *Species* | *Gain Genera* | *Gain Species* |
|---|---|---|---|---|
| Rhynchocephalia | 1 | 1 | 0 | 0 |
| Crocodilia | 7 | 20 | 1 | 1 |
| Chelonia | 61 | 189 | 4 | 11 |
| Lacertilia | 278 | 1,869 | 0 | 0 |
| Ophidia | 295 | 1,350 | 0 | 39 |
| Amphibia | 217 | 1,410 | 8 | 115 |
| Totals | 859 | 4,839 | 13 | 166 |

# REPORT OF THE DEPARTMENT OF PALAEONTOLOGY

By H. C. Stetson

Owing to Professor Raymond's absence on a sabbatical year the reports on invertebrate and vertebrate palaeontology are included under one head.

The reorganization of the collections has been greatly advanced through the efforts of Mr. W. E. Schevill and the collection of fossil fishes and reptiles is once more accessible. In addition he has prepared a list of types in these groups. This was an exceedingly laborious task and involved much searching through the literature, because any catalogues which may once have existed have long since disappeared.

Among the fossil invertebrates Mr. Schevill has practically completed the rearrangement of the trilobites. This group comprises a very large and important part of the collection.

The most valuable accession of the year, and indeed for many years, was brought about by an exchange with Tufts College, whereby we were able to acquire a complete skeleton, and an additional almost perfect skull, of a very unusual plesiosaur from the Lias at Whitby, Yorkshire. The skeleton had developed the "alum disease" so common in specimens from that locality, and in a few years more would have been completely lost. Recognizing that fact, and lacking a department of preparation, the authorities at Tufts were glad to make the exchange whereby a valuable specimen could be saved. Mr. Nelson at once set to work and removed the skeleton from the mortar in which many years ago it had been crudely embedded and thoroughly cleaned it, and the process of disintegration now appears to have been checked. Tufts College acquired the specimens by purchase from a Whitby dealer sometime during the seventies, and here our knowledge might have rested had not Mr. Schevill tracked down a very obscure publication of a local Yorkshire club of geologists of that date, and discovered that our specimen is the type of *Plesiosaurus longirostris*. The disappearance of this type had been commented upon by several English writers. The animal itself has several rather unusual anatomical features and is of importance in the phylogeny of the group.

Mr. Nelson has just finished preparing and mounting the second skull, and no piece of fossil preparation could be found which would call for more skill and delicacy of workmanship. A plesiosaur skull is fragile and the bones are very light. In this particular case the matrix was much harder than the bone, nevertheless, Mr. Nelson was able to produce a free standing mount which is now on exhibition.

The services of Mr. Charles J. Lang of the American Museum of Natural History, during his spare time, were secured to aid in mounting some of our vertebrate fossils. In this way a beautiful little camel Stenomylus and two species of three-toed horses were added to the exhibition collections, all three most excellent preparations. The necessity to do this emphasizes the fact that the Department of Preparation is undermanned to an extent that makes it impossible to keep pace with the accessions requiring attention.

Through the generosity of a friend the Museum was able to secure an Ichthyosaurian skull, one of the largest and most perfect ever found at the famous Wurtemberg locality. Through exchange with the University of California we received the skull of a rare Phytosaur from the Triassic of Arizona. Altogether, the exhibits of aquatic reptiles of the Mesozoic have been vastly improved.

Mr. Nelson has also placed on exhibition a very attractive mount of Diceratherium, the two-horned rhinoceros from the Miocene of Agate Spring, Nebraska. This has been placed in the entrance hall behind the slab from the same locality, as it is the bones of this animal which figure largely in this famous fossil field. Accessions to the fossil mammal collections include: a foot and parts of the jaws of Eohippus from the Eocene of Wyoming; the skull and fragments of jaws of Eumys, a Middle Oligocene rodent from Wyoming; and a good skull and jaws of Hipparion from Samos, all the gifts of a friend. The Schlaikjer expedition of 1930 brought in several Titanothere and Oreodont skulls, a good skeleton of Promerycochoerus, and a slab of horse bones from the Oligocene of Torrington, Wyoming, which was placed in the main hall, and is now in the process of preparation.

Part of the mastodon material long in the Museum and which was described by Warren in his classic monograph was taken from storage and placed on exhibition. This comprises several skulls and jaws showing different stages of development, from very young to adult.

Other accessions include several teeth of Isisteus, a rare shark from the Eocene of Morocco, the gift of Dr. A. Zimmerman; the teeth of Notidanus from the Tertiary of Germany; a slab of Elonichthys from Albert Mines, New Brunswick, the gift of Mr. Charles H. Taylor; and Allognathosuchus, an alligator from the Lower Wasatch of Wyoming, the gift of a friend.

Accessions to the invertebrates include a large collection of finely preserved crinoids, cystoids, starfish, and trilobites from the Upper Devonian of Hunsruch, Germany, the gift of a friend, and these will form valuable additions to the exhibits. Fine individuals of *Illaenus giganteus* and *Calymene tristani* were also given by the same person. Mr. F. N. Balch presented a collection of crinoids from Square Lake, Maine.

Professor Raymond's and my own time was partly occupied in working over the large collection from the Middle Cambrian obtained at Burgess Pass, B. C., in 1930. Many points of morphological importance in several groups were derived from this new material, particularly in the crustacean, worms and so-called holothurians. As a corollary to this, part of Professor Raymond's time in England has been spent studying Palaeozoic crustacea. The rest of our work has been stratigraphic, comprising in his case a survey of the classic British formations and in my own, work on recent marine sediments at the Woods Hole Oceanographic Institute.

# REPORT ON HELMINTHOLOGY

By J. H. Sandground

Since the appearance of the last annual report on the activities of this department much of my time has been occupied in the study of material collected in Africa and in compiling an account, which has just been published, of the life history of *Ternidens deminutus*. Some specimens of this parasitic nematode, which is related to the hookworm, had, on three past occasions, been found in African and Asiatic primates. A few specimens had also been identified from "hookworm" collections secured on isolated occasions at post-mortem examinations of natives from central East Africa. Very little, however, was known of its biology, pathological significance and incidence, and the opinion had been advanced that *Ternidens deminutus* was to be included in the list of rare helminths normally confined to primates, but occasionally presenting itself as an aberrant or accidental parasite of man. When, from information secured through the agency of a medical missionary home on furlough from Rhodesia, it became apparent that this view might require revision, a fund placed at my disposal from the bequest of the late Dr. Frederick C. Shattuck to the Department of Tropical Medicine of the Harvard Medical School enabled me to proceed to Africa to enquire into this subject. Six months in 1930 were spent examining the intestinal parasites of the natives at various centers in the Transvaal, southern and northern Rhodesia and Mozambique. A study was made of the eggs of *Ternidens deminutus*, establishing, for the first time, the criteria for their identification and distinction from the remarkably similar eggs of the hookworms with which they are readily confused. Ternidens infections of various grades of intensity were found to occur in nearly seventy per cent of the native population living in the southeastern border district of southern Rhodesia. Our survey showed an apparently rapid decline of the incidence of this infection in the natives living north, south and east of the region of high endemicity. Many monkeys were shot and examined in this district but none were found infected with Ternidens; nor were we successful in attempts at the experimental infection of monkeys, so that the parasite must be regarded, in this region at least, as primarily human in its proclivities. By direct observation and experimentation, and, where this procedure was not practicable, by analogy with the behavior of closely related parasites of other hosts, it was found that the infective larvae could not penetrate the skin, as does the hookworm, but must be ingested to produce infection. At necropsy something was learned of the pathogenic potentialities of Ternidens. Observations were also made on anthelminthic treatment for the elimination of these avid blood-consuming worms.

The intervals that came in the progress of our main investigations were utilized for the parasitological examination of the fauna, domesticated and wild, of various regions where we established stations. A large number of animals thus secured were skinned and otherwise preserved for inclusion in the museum collections. The study of the nematodes collected by myself and a large collection made by Mr. Loveridge in Tanganyika has recently been completed. In the account, soon to be published as a Museum Bulletin, a number of new forms are described. These collections have more than doubled the number of accessions in the catalogue of the helminthology collection, which is now beginning to assume a more rounded-out form with representative species of an ever-growing number of genera. The collection has in the past year also been enriched with several species of parasites from previously unrepresented groups through exchange with the Liverpool School of Tropical Medicine, Institut fur Schiffs- und Tropenhygiene, Hamburg, and the South African Institute for Veterinary Education and Research.

During a period of six weeks in the past summer, when I was privileged to use space and some of the facilities of the laboratory of the United States Fisheries Commission at Woods Hole, a representative collection of the local fish parasites was made, and the study of the life cycles of some of these forms was auspiciously commenced. The bionomics of marine fish parasites present a very extensive field, the cultivation of which is scarcely begun. The fertility of this field, from the academic as well as the economic viewpoints, is, in my opinion, very great and should attract graduate students of biology.

I, myself, cannot devote much time to this subject at present since my attention must be directed to the completion of a study on the extensive collection of parasites assembled by Dr. Ralph E. Wheeler in Indo-China and also to some important material brought back from Guatemala where Professor Richard P. Strong has recently conducted investigations on the serious human parasite *Onchocerca caecutieus.*

# REPORT ON FISHES

By N. Borodin

The work of relabeling many thousands of bottles and of cleaning them has progressed steadily, together with picking out the type specimens, but is not yet nearly completed. To date 489 types and cotypes have been card-catalogued.

A new collection of African fishes brought by Mr. A. Loveridge was worked on. The preliminary paper on the new species found in this collection is published in the Proceedings of the New England Club, **12**, pp. 49–54 and the complete paper is ready for print.

Bottling and labeling a large collection of Russian Far-Eastern fishes (165 specimens) took some time.

*Collection of fish skeletons:* Since the time of L. Agassiz and Poey a considerable collection of fish skeletons has accumulated in the Museum of Comparative Zoölogy. They were stored in one of the attic rooms and were not catalogued or listed. About 500 trays filled with them were moved down into the laboratory room of the Fish Department. A good part of my time has been spent in examining and putting in order this collection. Many of these skeletons were prepared and labeled, each portion of skeleton separately, by the great naturalist Poey, six of them being his types.

Many fish skeletons, both mounted and unmounted, were found to be duplicates so that they may be disposed of. From this point of view the whole material can be presented in such a way:

| | | |
|---|---|---|
| A. Whole skeletons mounted: | duplicates | 88 |
| | reserved for M. C. Z. | 146 |
| B. Skeletons unmounted and skeleton parts: | | |
| | duplicates | 107 |
| | reserved for M. C. Z. | 152 |
| | Total | 495 |

All these specimens are identified, most of them with specific, part with only generic names. They are labeled and catalogued and measures for controlling injurious insects have been taken. Part of the duplicates have been used already for exchange.

*Accessions:* The Museum received: (1) The African fresh-water and marine fishes, collected by Mr. A. Loveridge. This consists of 75 species of fresh-water fishes from the Central African Lakes and 31 species of marine fishes from Mombasa, east coast of Africa. There are about nine hundred specimens in both collections. (2) A collection of 165 species of Russian Far-Eastern fishes, received in exchange with the Pacific Fisheries Research Institute, Vladivostok, Russia.

With these new accessions the Museum of Comparative Zoölogy now possesses the largest number of African and Russian fishes of any museum in America. The latter are important for parallel study of Russian and North American fresh-water fishes which are in many respects very closely allied one to the other.

Other accessions are: 15 specimens of African fishes from Mr. George Schwab, 6 specimens of Arizona fishes from J. C. Phillips, 7 specimens of Honduras fishes from R. Stadelmann, 5 specimens of African fishes from G. H. Sandground, 6 specimens of Mexican fishes from W. W. Brown, 3 specimens of Panama fishes from Dr. Dill, 3 specimens of Honduras fishes from Ira D. George, 13 specimens of Moroccan fishes from Dr. F. Werner, 2 specimens of Indian fishes from Dr. Preshad (one type), 3 specimens of Florida fishes from G. Nelson and 93 specimens of Canal Zone fishes from Dr. Thomas Barbour.

Temporary exhibits of deep sea fishes and of the Russian Far-Eastern fishes, with a popular explanation, were made in the Exhibition Halls of the Museum.

*Exchanges:* Besides the fishes received in exchange with the Russian institution at Vladivostok the Museum received: (1) From the British Museum 31 specimens (1 paratype) of African fishes in exchange for a collection of flat fishes. (2) From the American Museum of Natural History a collection of 15 fish skeletons and 47 Chinese fishes (27 paratypes) in exchange for a collection of duplicates of skeletons of fishes. (3) From the Zoölogical Museum of the University of Michigan 11 specimens (4 paratypes) in exchange for the fishes sent to this museum previously.

*Visitors:* Mr. J. T. Nichols, Curator of Recent Fishes of the

American Museum of Natural History, made a short visit to this museum in September, 1930.

Messrs. J. H. Flemming and L. L. Snyder of the Ontario Museum of Zoölogy at Toronto, visited the Museum in October 23, 1930. They were interested in the technical side of keeping the specimens of the study collection. Several stuffed specimens of fishes were donated, by their request, to the Zoölogical Museum of Toronto.

Mr. G. S. Myers of the Zoölogical Museum of Stanford University spent two days at the Museum studying the collection of unpublished drawings of fishes, prepared for L. Agassiz, and never published.

# REPORT ON BIRDS' EGGS AND NESTS

By Winthrop S. Brooks

Owing to the absence of the Custodian of Birds' Eggs and Nests very little work has been done in this department during the past year.

A few accessions have been received during the year, noteworthy among them being 24 sets of eggs, some with nests, collected by Mr. Arthur Loveridge in Tanganyika Territory, Africa; 3 Sarus Cranes' eggs from Dr. L. C. Jones, laid in captivity at Falmouth, Mass.; 1 historic set of eggs of *Chen hyperbrea* x *Chen caerulescens* from Mr. F. H. Kennard; nest and eggs of Alder Flycatcher from J. L. Peters and several welcome items from Harry Stephens.

# REPORT ON THE FOSSIL ECHINODERMS

By Robert T. Jackson

The Curator spent considerable time revising parts of the collections of Mesozoic and Tertiary Echini. To assist Dr. H. L. Clark he selected and labeled 19 lots of Recent Echini from duplicates of the collection that he gave to the Museum some twenty years ago. These 19 lots were sent out to as many foreign or American museums.

Some important additions of Fossil Echini were received during the year. From Mr. Herbert M. Hale, of Adelaide, South Australia, as a gift, some 366 specimens, quite largely of *Ivenia forbesi* T. Woods, from the Tertiary of Devon Downs, Lower Murray Island, South Australia. This material supplements that received from H. L. Clark and H. M. Hale, as reported last year. A choice lot of six specimens, representing as many species, from the Tertiary of Cuba, were received as a gift from Dr. C. S. Aguayo. Eight specimens of *Schizaster diabloensis* Kew, from the Tertiary of Ventura Co., California, were received from Mr. Herbert S. Schenck, of Leland Stanford University.

A choice series of 169 specimens, from the Cretaceous of Texas, was purchased from Mr. J. B. Litsey of Austin, Texas. This material, which for the most part is very beautifully preserved, added to that purchased last year from the same collector, is an important addition to the Museum's collection of American Fossil Echini.

# REPORT ON THE COELENTERATES

### By Elisabeth Deichmann

During the year the collections of Alcyonaria were catalogued and about 2,000 entries were made. In connection with the Blake report on the West Indian Alcyonaria it was necessary to examine all of the Alcyonacea belonging to the United States National Museum. The manuscript for that paper was made ready for publication with some aid from Miss Vickson, now editor at the Harvard Observatory.

With the Director's permission, I acted as instructor in invertebrates at the Hopkins Marine Station of Stanford University, Pacific Grove, during the summer quarter. During this time I did some collecting for the Museum and completed a paper on the Holothurians of the Californian waters.

A number of Alcyonacea from off the east coast of North America have been received as a gift from the United States National Museum.

It is planned this year to commence a complete rearrangement of the great collections of stony corals, which have long been in complete confusion.

# REPORT ON THE LIBRARY

By Eleanor K. Sweet

The routine work of the Library has gone on about as usual during the past year. The daily accessions, occupying most of Miss Hamilton's time, and the work in connection with the circulation of books, attended to chiefly by Miss Howes, have been a regular part of each day's work. While Miss Hamilton has answered most of the telephone calls, Miss Howes and I have done most of the reference work. Cataloguing, preparation of volumes for binding, filing, etc., have progressed as the daily routine allowed.

I have felt for some time that the accessioning and cataloguing of our thousands of author's reprints and separates was occupying more time than necessary and that it was costing too much to put them into pamphlet covers. After consulting several members of the staff of the College Library as to possible methods of keeping such material, we decided to care for these unbound pamphlets by means of a pamphlet file. With some few exceptions, we are now keeping unbound reprints or separates in large pamphlet boxes made especially for our shelves; the pamphlets are arranged alphabetically by authors' names, regardless of subject. Cards are put into our catalogue showing author's name, title, and date for each reprint, but the more elaborate bibliographical details as to place of publication, reference, etc., are omitted. If the need arises, we can at any time transfer an item from this pamphlet collection to the regular classified collections of the Library, or put it into a pamphlet cover if it is much used. Bibliographical details can also be added to the catalogue card at any time. Since April, when we first adopted this arrangement for pamphlets, we have thus disposed of over 1,500 pamphlets, or more than half of the total number added during the whole year.

About eighteen months ago Prof. Wheeler turned over to us a very large collection of reprints; these were sorted during this last year and the duplicates discarded; the remainder of the collection will go into our pamphlet file during the coming year.

The work on the Garman library has been practically completed during the year. In all, we received from Mr. Garman's library 729 volumes and 2,419 pamphlets, and sold many duplicates.

With help from a fund for the purchase of biological textbooks we bought some much-needed books of this class during the year; several sadly worn textbooks were rebound at the same time. A collection of textbooks which we brought together from scattered places on our shelves two years ago continues to be useful to the students in the biology courses. During the two reading periods "reserved" books were in considerable demand.

There are hundreds of unbound volumes in the Library which should be bound. We try as far as possible to keep binding those current serials which are most used, but if funds were available there are many sets less used but none the less valuable which should be preserved by binding. In the past year 564 volumes were bound at the College Bindery; and 1,749 pamphlets were put into Gaylord covers here at the Library. A large part of these pamphlets have been waiting for covers for several years.

We have tried to keep apace with the yearly supplement to the Union List of Serials by sending to the H. W. Wilson Co. all titles of new serials received in this Library and notices of any important changes in our holdings as recorded in the original list.

I have received various requests from libraries or individuals for bibliographical information about old or rare publications which are to be found in this Library but in few others in the country; also frequent requests to have typed or photostat copies made from similar material. Several manuscripts, collections of letters, etc., which we possess have been loaned from time to time to people who have published them in part or in full. Last fall we received the two volumes of "Letters of John James Audubon, 1826–1840" from Mr. Howard Corning, who edited them from material in our possession as companion volumes to the "Journal of John James Audubon," published by him a year earlier. In editing the volume "Up and Down California in 1860–64, The Journal of William H. Brewer ***," Mr. Francis P. Farquahar has made use of drawings and photographs which once belonged to Prof.

Whitney. Prof. Wheeler has been working on one of our manuscripts, that by Lamarck, which he hopes to publish sometime soon. Mr. S. W. Geiser has this summer consulted various letters and manuscripts by Boll, Belfrage, Audubon and others, which he will use in his series on "Naturalists of the Frontier."

We are grateful to the following members of the Museum staff who give us regularly certain serial publications: Dr. Barbour, Mr. Bangs, Dr. Clark, Dr. Bigelow, Mr. Banks, Dr. Allen, Mr. Clench, Mr. Loveridge, Mr. Griscom, Dr. Bequaert, and Prof. Wheeler. Prof. Daly, Prof. Davis, and Prof. Parker also give us several current serials. Through Prof. Brues, a number of sets of entomological serials have been transferred to our Library from the Bussey Institution. Many other gifts of volumes, reprints and separates have been received from members of the staff and from Harvard College Library, as well as from other scientists and institutions at a distance. Our exchange list continues to grow as we add from time to time names of new institutions who send us their publications in return for the Bulletins or Memoirs of this Museum.

While too many figures are bewildering, some are necessary to show the yearly growth of our Library and its circulation. During this last year we added to the collection 1,481 volumes, 2,930 pamphlets, and many parts of volumes. These bring our total figures, on July 31, 1931, to 71,566 volumes and 82,698 pamphlets.

Circulation figures are as follows: 5,226 books were borrowed for use outside the Library, 1,602 of these by members of the Museum staff and 3,527 by teachers, students and others not connected with the Museum. Other institutions, in Greater Boston and in other parts of the country, borrowed 97 volumes from us through the Inter-Library Loan system. Our total circulation shows an increase of about fifteen per cent over last year. Of books used in the Library we can keep no record, but they would probably total about 3,500.

# PUBLICATIONS

## FOR THE YEAR 1930–1931

## (1 August, 1930 — 31 July, 1931)

## Museum of Comparative Zoölogy

*Publications.*—The following articles have been printed during the year.

Bulletin: —

Vol. LX

No. 6. Notes on Invertebrate Fossils, with Descriptions of New Species. By Percy E. Raymond. 50 pp., 5 pls. January, 1931.

Vol. LXXI

No. 1. Studies in Coral Reefs. By J. Stanley Gardiner. 16 pp. August, 1930.

No. 2. Notes on the Structure of Dinichthys and Macropetalichthys. By Henry C. Stetson. 23 pp., 7 pls. September, 1930.

No. 3. The Holothurians of the Western Part of the Atlantic Ocean. By Elisabeth Deichmann. 185 pp., 24 pls. November, 1930.

No. 4. Type Specimens of Mammals in the Museum of Comparative Zoölogy. By Glover M. Allen. 63 pp. January, 1931.

No. 5. Additional Notes of the Birds of the Almirante Bay Region of Panama. By James L. Peters. 55 pp. February, 1931.

No. 6. Notes on the Birds of Rio Frio (near Santa Marta) Magdalena, Colombia. By P. J. Darlington, Jr. 74 pp. March, 1931.

Vol. LXXII

No. 1. New and Little Known Ants of the Genera Macromischa, Creosomyrmex and Antillaemyrmex. By William M. Wheeler. 343 pp. July, 1931.

No. 2. On the Genus Anostomus (Family Characinidae). By N. A. Borodin. 17 pp., 4 pls. July, 1931.

---

### *Publications by the Museum Staff*

Allen, G. M.

The Birds of Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 636–748.

The Mammals of Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 569–633. (With H. J. Coolidge, Jr.)

Type Specimens of Mammals in the Museum of Comparative Zoölogy. *Bull. Mus. Comp. Zoöl.*, **71**, no. 4, pp. 227–289.

BANGS, O.

Birds of the Kelley-Roosevelts Expedition to French Indo-China. *Field Mus. Nat. Hist. Publ.*, Zoöl. Ser., 1931, **18**, no. 3, pp. 33–119, 1 pl. (map). (With J. Van Tyne.)

BANKS, N.

Antlike Spiders of the Genus Myrmarachne from the Philippines. *Psyche*, 1930, **37**, pp. 207–218, 1 pl.

New Neuropteroid Insects from the United States. *Psyche*, 1930, **37**, pp. 223–233, 1 pl.

Phalangida from Borneo. Sarawak Museum Journal, 1930, **4**, no. 12, pp. 59–87, 2 pls.

Neuropterous Insects. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 1,045–1,047, 2 figs.

Arachnida (Norwegian Zoölogical Expedition to Galapagos Islands, 1925). *Nyt. Magazin Naturv.*, 1931, **68**, pp. 271–278.

Some Oriental Neuropteroid Insects. *Psyche*, 1931, **38**, pp. 56–70, 1 pl.

On Some Psocidae from the Hawaiian Islands. *Proc. Harv. Ent. Soc.*, 1931, **7**, pp. 437–441, 3 pls.

J. H. Emerton. *Can. Ent.*, 1931, **63**, pp. 23–24.

Neuropteroid Insects from the Malay Peninsula. *Journ. Fed. Malay States Mus.*, 1931, **16**, pp. 377–410, 3 pls.

Neuropteroid Insects from North Borneo, Particularly from Mt. Kinabalu. *Journ. Fed. Malay States Mus.*, 1931, **16**, pp. 411–430, 2 pls.

BARBOUR, T.

Reptiles and Amphibians from Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 769–786, figs. 462–465. (With Arthur Loveridge.)

Reptiles and Amphibians from the Central African Lake Region. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 786–796. (With Arthur Loveridge.)

Curiosities of Scientific Names. *Science*, 1930, **72**, no. 1,861, p. 219. (With Glover M. Allen.)

The Experiment Station in Cuba. *Harv. Alumni Bull.*, 1930, **33**, 7, p. 197.

A Bit of Early Local History. *Harv. Alumni Bull.*, 1930, **33**, 9, p. 257.

A List of Antillean Reptiles and Amphibians. *Zoölogica*, 1930, **11**, no. 4, pp. 61–116.

Another Bit of Local History. *Harv. Alumni Bull.*, 1931, **33**, 15, pp. 464–465.

George Washington's Stuffed Birds — 140 Years Old. *The Field*, 1931, **157**, no. 4,076, p. 185.

Do We Feel the Sun More than Americans? *The Field*, 1931, **157**, no. 4,096, p. 945.

Food Value of Carangidae. *The Field*, 1931, **157**, no. 4,096, p. 946.

Bequaert, J.

Postscript to "Stylopized Vespidae," in Psyche, **36**, 1929, pp. 249–282. *Bull. Brooklyn Ent. Soc.*, 1930, **25**, pp. 226–228. (With G. Salt.)

Medical and Economic Entomology. *The African Republic of Liberia and the Belgian Congo*, 1930. **2**, pp. 797–1,001.

Ashmead's Genus Polistella. *Pan-Pacific Entomologist*, 1930, **7**, pp. 91–93.

Review of R. Matheson's "A Handbook of the Mosquitoes of North America." *Bull. Brooklyn Ent. Soc.*. 1930, **25**, pp. 182–184.

Notes on American Nemestrinidae. *Psyche*, 1930, **37**, pp. 286–297.

Notes on Hippoboscidae. 2. The Subfamily Hippoboscinae. *Psyche*, 1930, **37**, pp. 303–326.

Synopsis des Tiques du Congo Belge. *Rev. Zoöl. Bot. Afric.*, 1931, **20**, pp. 209–251.

Moroccan Folded-winged Wasps, mainly collected by Professor T. D. A. Cockerell's Party. *Journ. New York Ent. Soc.*, 1931, **39**, pp. 131–137.

The Genus Lasia in North America, with Descriptions of Two New Species. *American Museum Novitates*, 1931, no. 455, pp. 1–11.

The Color Forms of the Common Hornet, *Vespa crabro Linnaeus. Konowia*, 1931, **10**, pp. 101–109.

Studies of African Land and Fresh-water Mollusks. I. On some African Species of Bulinus. *Occ. Papers Boston Soc. Nat. Hist.*, 1931, **5**, pp. 357–367. (With W. J. Clench.)

Bigelow, H. B.

Siphonophorae from the Arcturus Oceanographic Expedition. *Zoölogica,* 1931, **7,** no. 11.

Oceanography. Its Scope, Problems, and Economic Importance. 1931. Houghton Mifflin Co., 263 pp.

Bryant, E. B.

New Species of the Genus Xysticus. *Psyche,* 1930, **37,** pp. 133–140, 2 pls.

A Revision of the American Species of the Genus Ozyptila. *Psyche,* 1931, **37,** pp. 377–388, 3 pls.

Brues, C. T.

Aneurobracon, a Remarkable New Genus of Braconidae from Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.,* 1930, no. 5, pp. 1,002–1,003.

Jewelled Caddis-worm Cases. *Psyche,* 1930, **37,** pp. 392–394.

Carpenter, F. M.

A Permian Blattid from Brazil. *Bull. Geol. and Mineral. Survey of Brazil,* 1930, pp. 1–4.

The Lower Permian Insects of Kansas. Part 2. The Orders Paleodictyoptera, Protodonata, and Odonata. *Amer. Journ. Sci.,* 1931, **21,** (2), pp. 97–139.

The Lower Permian Insects of Kansas. Part 3. The Protohymenoptera. *Psyche,* 1931, **37,** pp. 343–374.

The Biology of the Mecoptera. *Psyche,* 1931, **38,** pp. 41–55.

Insects from the Miocene (Latah) of Washington. *Annals Ent. Soc. Amer.,* 1931, **24** (2), pp. 307–332.

Clench, W. J.

Notes on Physidae with Descriptions of New Species. *Occas. Papers Boston Soc. Nat. Hist.,* 1930, **5,** pp. 301–315.

A Note on the Habitat of Viviparus subpurpureus (Say). *Nautilus,* 1930, **44,** p. 70.

Land Shells from Lubang Island, Philippines. *Occas. Papers Boston Soc. Nat. Hist.,* 1931, **5,** pp. 333–339, pl. 17. (With A. F. Archer.)

Camptoceras (Culmenella) prashadi nom. nov. *Nautilus,* 1931, **44,** p. 80.

On Some African Species of Bulinus. *Occas. Papers Boston Soc. Nat. Hist.*, 1931, **5**, pp. 357–367, pl. 18. (With J. Bequaert.)

Cephalopods. *Bull. Boston Soc. Nat. Hist.*, 1931, no. 60, pp. 10–14, 4 figs.

Exploring the Lower Everglades in Florida. *Harvard Alumni Bull.*, 1931, **33**, pp. 1,211–1,213, 4 figs.

"Ligging" in the Everglades of Florida. *Nautilus*, 1931, **45**, pp. 10–15.

A Preventative for the Scaling of the Periostracum. *Nautilus*, 1931, **45**, pp. 30–31.

COOLIDGE, HAROLD J., JR.

Climate of Liberia. *Monthly Weather Report, U. S. Dept. of Agriculture*, Washington, D. C., 1930, **58**, pp. 291–292.

The Mammals of Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 569–633. (With G. M. Allen.)

DARLINGTON, P. J., JR.

Notes on the Birds of Rio Frio (near Santa Marta), Magdalena, Colombia. *Bull. Mus. Comp. Zoöl.*, 1931, **71** (6), pp. 349–421.

DEICHMANN, ELISABETH

The Holothurians of the Western Part of the Atlantic Ocean. *Bull. Mus. Comp. Zoöl.*, 1930, **71**, no. 3, pp. 44–226, pls. 1–24.

DOW, R. P.

Notes on the Prey of Wasps. *Psyche*, 1930, **37**, pp. 181–182.

Wheeler's "Demons of the Dust," a review. *Bull. Boston Soc. Nat. Hist.*, 1931, **59**, pp. 42–43.

Odonata from Santa Clara, Cuba. *Proc. Biol. Soc. Wash.*, 1931, **44**, pp. 55–60.

GREENWAY, J., JR.

A Jefferson Letter of Historical and Ornithological Interest. *Auk*, 1931, **48**, no. 2, pp. 175–180.

GRISCOM, LUDLOW

Studies from the Dwight Collection of Guatemala Birds. III. *Amer. Museum Novitates*, 1930, no. 438, pp. 1–18.

The Interesting May of 1930. *Bull. Essex County Ornithological Club*, 1931, pp. 5–13.

Dwarf Mistletoe and Other Plants New to New Jersey. *Rhodora,* 1931, p. 101.

Maunsell Schieffelen Crosby, obituary notice. *Auk,* 1931, pp. 320–322.

Another Station for *Panicum calliphyllum. Rhodora,* 1931, pp. 131–132.

Notes on Rare and Little Known Neotropical Pygmy Owls. *Proc. New Eng. Zoöl. Club,* 1931, **12**, pp. 37–43.

Iselin, C.

A Report on the Coastal Waters of Labrador. Based on Explorations of the "Chance" during the summer of 1926. *Proc. Amer. Acad. Arts and Sci.,* 1930, **66**, no. 1.

Jackson, R. T. cl

An Exceptionally Large *Onodea sensibilis. Rhodora,* 1930, **32**, no. 283. p. 225.

Arrangement of Plants for Effective Gardening. Peterborough *Transcript,* 1931, **83**, no. 11, pp. 1 and 6.

The Importance of Giving Page References in Descriptions of Plates. *Science,* 1931, n. s., **73**, no. 1,891, pp. 339–340.

Loveridge, A.

Reptiles and Amphibians from Liberia. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.,* 1930, no. 5, pp. 769–786, figs. 462–465. (With Thomas Barbour.)

Reptiles and Amphibians from the Central African Lake Region. *Cont. Dept. Trop. Med. and Inst. Trop. Biol. Med.,* 1930, no. 5, pp. 786–796. (With Thomas Barbour.)

On Two Amphibious Snakes of the Central African Lake Region. *Bull. Antivenin Inst. Amer.,* 1931, **5**, pp. 7–12, figs. 1–2.

Peters, J. L.

A Review of the Races of *Picus lineatus* Linné. *Occas. Papers Boston Soc. Nat. Hist.,* 1930, **5**, pp. 317–322.

Western Sandpiper in Massachusetts in Spring. *Auk,* 1930, **47**, pp. 562–563.

*Buteo platypterus* in Porto Rico. *Auk,* 1930, **47**, p. 563.

Notes on Some Night Herons. *Proc. Boston Soc. Nat. Hist.,* 1930, **39**, no. 7, pp. 263–277.

Additional Notes on the Birds of the Almirante Bay Region of Panama. *Bull. Mus. Comp. Zoöl.*, 1931, **71**, no. 5, pp. 293–345.

Remarks on the Hawks hitherto included in the Genus Ibycter. *Proc. Biol. Soc. Wash.*, 1931, **44**, pp. 23–26.

Phillips, J. C.

American Game Mammals and Birds. A Catalogue of Books, 1582 to 1925. 1930. Houghton Mifflin Co., 639 pp.

The Flight Speed of Birds. *The Sportsman*, 1930, **8**, no. 5, pp. 59 and 86.

A Proposed American Game Policy, to be discussed at the Seventeenth Annual American Game Conference, American Game Association, 1930, New York, pp. 1–23. (Written in conjunction with a Committee on Game Policy of the American Game Association.)

American Waterfowl. Their Present Situation and the Outlook for their Future. 1930. Houghton Mifflin Co., 312 pp., ills. (With Frederick C. Lincoln.)

Classics of the American Shooting Field. A Mixed Bag for the Kindly Sportsman. 1930. Houghton Mifflin Co., 214 pp. (With Dr. Lewis Webb Hill.)

Naturalists, Nature Lovers and Sportsmen. *Auk*, 1931, **48**, no. 1, pp. 40–46.

Raymond, P. E.

Notes on Invertebrate Fossils with Descriptions of New Species. *Bull. Mus. Comp. Zoöl.*, 1931, **55**, no. 6, pp. 165–213.

A New Factor in the Transportation and Distribution of Marine Sediments. *Science*, 1931, **73**, no. 1,882, pp. 105–106. (With H. C. Stetson.)

A Structure Section across the Canadian Rockies. *Journ. of Geol.*, 1931, **39**, no. 2. pp. 97–116. (With Bradford Willard.)

Sandground, J. H.

Notes and Descriptions of Some Parasitic Helminths Collected by the Expedition. *Cort. Dept. Trop. Med. and Inst. Trop. Biol. Med.*, 1930, no. 5, pp. 462–486.

Studies on the Life History of Ternidens deminutus, a Nematode Parasite of Man, with Observations on its Incidence in Certain Regions in South Africa. *Ann. Trop. Med. and Parasitology*, 1931, **25**, no. 2, pp. 147–184.

Stetson, H. C.

Notes on the Structure of Dinichthys and Macropetalechthys. *Bull. Mus. Comp. Zoöl.*, 1930, **71**, no. 2, pp. 19–39.

A New Factor in the Transportation and Distribution of Marine Sediments. *Science*, 1931, **73**, no. 1,882, pp. 105–106. (With P. E. Raymond.)

Studies on the Morphology of the Heterostraci. *Journ. of Geol.*, 1931, **39**, no. 2, pp. 141–154.

Sweet, E. K.

Suggestions for Preparing a Bibliography. 1931. Cambridge, Mass. Museum of Comparative Zoölogy, 7 pp.

Wheeler, W. M.

What is Natural History? *Bull. Boston Soc. Nat. Hist.*, 1931, no. 59, pp. 3–12.

Demons of the Dust, a Study in Insect Behavior. 1930. W. W. Norton, New York.

New and Little-Known Species of Macromischa, Croesomyrmex, and Antillaemyrmex. *Bull. Mus. Comp. Zoöl.*, 1931, **72**, pp. 3–34.

## INVESTED FUNDS OF THE MUSEUM

### In the Hands of the Treasurer of Harvard College

| | |
|---|---:|
| Gray Fund (1859) | $55,000.00 |
| Permanent Fund (1859) | 129,216.27 |
| Sturgis Hooper Fund (1865) | 119,540.82 |
| Humboldt Fund (1869) | 12,263.50 |
| Agassiz Memorial Fund (1875) | 327,726.41 |
| Teachers and Pupils Fund (1875) | 8,353.41 |
| Virginia Barret Gibbs Fund (1892) | 10,105.58 |
| Willard Peele Hunnewell Memorial Fund (1901) | 7,338.69 |
| Maria Whitney Fund (1907) | 9,616.27 |
| Alexander Agassiz Fund (1910) | 105,450.00 |
| Alexander Agassiz Expedition Fund (1910) | 122,972.60 |
| George Russell Agassiz Fund (1911) | 55,000.00 |
| George Russell Agassiz Fund Special (1912) | 55,000.00 |
| Maria Whitney and James Lyman Whitney Fund (1912) | 1,870.95 |
| Louis Cabot Fund (1917) | 7,103.09 |
| Harvard Endowment Fund (1917) | 1,100.00 |
| William and Adelaide Barbour Fund (1923) | 28,569.03 |
| William Brewster Fund (1924) | 68,572.47 |
| Anonymous No. 7 Fund (1924) | 59,762.44 |
| Alexander Agassiz Fellowship in Oceanography Fund | 29,200.40 |
| | $1,213,761.93 |

The payments on account of the Museum are made by the Bursar of Harvard University, on vouchers approved by the Director or by his delegated authority. The accounts are annually examined by a committee of the Overseers. The income of funds which are restricted is annually charged in an analysis of the accounts, with vouchers, to the payment of which the incomes are applicable.

The income of the Gray Fund can be applied to the purchase and maintenance of collections, but not for salaries.

The income of the Humboldt Fund (about $500) is to be applied for the benefit of one or more students of Natural History for special work, out of course, in the Museum.

The income of the Virginia Barret Gibbs Scholarship Fund, of the value of $400, is assigned annually with the approval of the Faculty of the Museum, on the recommendation of the Professors of Zoölogy and of Comparative Anatomy in Harvard University, "in supporting or assisting to support one or more students who may have shown decided talents in Zoölogy, and preferably in the direction of Marine Zoölogy."

The income of the Whitney Fund can be applied for the care (binding) and increase of the Whitney Library.

The Alexander Agassiz Expedition Fund was bequeathed by Alexander Agassiz for the publication of reports on collections brought together by the expeditions with which he was connected.

The income of the Louis Cabot Fund can be applied to the purchase of books on travel, sport, and natural history.

The income of the William and Adelaide Barbour Fund is "expended wholly at the discretion of the Director of the Museum of Comparative Zoölogy * * * to increase the collections of the Museum either by exploration or the purchase of desirable material."

Three quarters of the income of the William Brewster Fund can be used for the salary of a competent ornithologist and one quarter "at the discretion of the Director of the Museum for the increase of the collection by purchase, or for the renewal or repair of the cases, or for the publication of matter contained in my manuscripts."

The income of the Alexander Agassiz Fellowship in Oceanography Fund is awarded each year by the Faculty of the Museum to some person, or persons, working at the Museum in the field of Oceanography.

The income of Anonymous No. 7 Fund is devoted to increasing the salaries of such of the curators as the Faculty of the Museum may select.

Applications for facilities to work either at the Harvard Biological Laboratory and Botanic Garden at Soledad, Cuba, or at the Barro Colorado Island Laboratory in the Panama Canal Zone may be addressed to the Director. A limited number of Fellowships are available for workers at Soledad. Details concerning the concessions allowed to workers in the Canal Zone may be had upon application to the Director. This laboratory is administered by the Executive Committee of the Institute for Research in Tropical America. Harvard is one of several institutions supporting the institution and the Director of the Museum at present is Chairman of the Committee.

Applications for the tables reserved for advanced students at the Woods Hole Station, of the United States Bureau of Fisheries, should be made to the Faculty of the Museum before the first of May. Applications should state their qualifications, and indicate the course of study they intend to pursue.